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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,358	08/02/2001	Tomoharu Kurita	212865	6028
23460	7590	11/01/2005		
LEYDIG VOIT & MAYER, LTD TWO PRUDENTIAL PLAZA, SUITE 4900 180 NORTH STETSON AVENUE CHICAGO, IL 60601-6780			EXAMINER KRUER, KEVIN R	
			ART UNIT	PAPER NUMBER
			1773	

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/921,358

Applicant(s)

KURITA ET AL.

Examiner

Kevin R. Kruer

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5,7 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7 and 18-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Supplemental Non-Final Action***

This Office Action is a supplemental office action in response to the amendment filed June 16, 2005. This Office Action takes into consideration the signed Declaration filed June 23, 2005.

***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-5, 7, and 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (US 3,936,575) in view of Frost (US 3,984,375), Akahoshi (US 4,970,107), and Lu (US 3,897,393).

Watanabe teaches a metal-clad laminate for flexible printed circuit boards comprising a resin selected from polyvinyl chloride, polyamide-imide, and polyimide (col 1, lines 9+). The conductive foils utilized in such laminates are conductive foils with a thickness of 15-110um (col 9, lines 53+).

Watanabe does not teach a polyamide-imide resin that reads on the claimed "heat resistant resin." However, Frost teaches a polyamide-imide resin consisting essentially of a repeating unit depicted by the formula in the abstract. When R is the radical of column 2, line 11, the formula reads on formula 1 of claim 1. When R is the radical of column 2, line 27, the formula reads on formula 2 of claim 19. The polyamide-imide possesses thermal stability, toughness, good flexibility, and other properties (col 1, lines 8+). The polymer is useful as a film for electrical insulation (col 1, lines 8+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to utilize the polyimide-amide polymers taught in Frost as the resin in the printed circuit board taught in Watanabe. The motivation for doing so would have been that said polymers possess thermal stability, toughness, and good flexibility.

Neither Watanabe nor Frost teaches that the surface of the heat resistant resin that contacts the metal layer should have the claimed surface roughness. However, Akahoshi teaches that a copper layer for a printed circuit board may be surface roughened so that it has pit-like recesses with diameters of from about 0.1-1  $\mu\text{m}$  (col 1, lines 6+). Said roughness improves adhesion. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to roughen the copper layer of the printed circuit board taught in Watanabe so that it had a roughness of 0.1-1  $\mu\text{m}$ . The motivation for doing so would have been to improve adhesion between the resinous layer and the copper layer.

Neither Watanabe nor Frost teaches that the polyimide polymer should have the claimed insoluble content. However, Lu teaches polyimides may be cured at elevated temperatures to further improve their physical, chemical, and thermal properties. When cured, the polyimide polymers become insoluble in cresol (col 4, lines 54+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to cure the polyimides taught by Frost. The motivation for doing so would have been to improve their physical, chemical, and thermal properties. Once cured, the polymer is understood to inherently meet the claimed insoluble content limitations.

With respect to the claimed initiation tear strength, elastic modulus retentivity, dimensional stability, sold heat resistance, adhesion, and radius of curvature, of the

claimed "heat resistant polymer," the examiner takes the position that the laminate taught by Watanabe in view of Frost necessarily possess said properties because said laminate comprises the same layers, having the same composition and laminated in the same relative order as the claimed laminate.

With respect to the method limitations of claim 1 that the laminate is produced by "applying a solution containing an organic solvent and a condensation polymer to the metal foil and drying the laminate," Frost teaches that the polymer may be applied as a solution, and baked (col 4, lines 19+). Furthermore, the examiner notes that the method of making a claimed product does not patentably distinguish a claimed product from the product taught in the prior art unless it can be shown that the method of making the product inherently results in a materially different product. In the present application, no such showing has been made. The examiner takes the position that the laminate taught by Watanabe in view of Frost reads on the claimed laminate because it comprises the same layers, having the same composition and laminated in the same relative order as the claimed laminate. The laminate taught by Watanabe in view of Frost is understood to read on the laminates claimed in claims 2 and 3 for similar reasons.

#### ***Response to Arguments***

Applicant's arguments filed June 16, 2005 have been fully considered but are moot in view of the newly applied rejections.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin R. Kruer whose telephone number is 571-272-1510. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin R. Kruer  
Patent Examiner-Art Unit 1773